# Assessment Schedule – 2009

## Human Biology: Describe how humans respond to pathogens (90176)

### Evidence Statement

**QUESTION ONE**

| Evidence contributing to Achievement | Evidence contributing to Achievement with Merit | Evidence contributing to Achievement with Excellence |
|---|---|---|
| *Describes any TWO of:*<br><br>• Area becomes red.<br>• Area gets hot.<br>• Area swells.<br>• Area gets sore / painful.<br><br>These can be found in either a) or b)<br><br>AND *describes ONE idea of:*<br><br>• Histamines signals vasodilatation / widening of blood vessels.<br><br>• Increased blood flow<br><br>• Histamines increase the permeability of blood vessels (they become more leaky).<br><br>• Increases white blood cells / phagocytes in the area. | *Describes any THREE symptoms (as Achievement).*<br><br>*And explains ONE of:*<br><br>Eg histamines signal blood capillaries to widen → more blood flows to the area / allows more defence cells to get to the area.<br><br>Eg histamines signal leaky blood vessels → more fluid / plasma / proteins / defence cells leak out of the capillaries<br><br>Eg increases white blood cells / phagocytes in the area to engulf pathogens and digest / destroy them. | *Discussion **links** ideas in Merit to the symptoms of an inflammatory response **and** how the inflammatory response stops invading pathogens from spreading further in the body.*<br><br>*(Linking Histamine action to increased white blood cells / phagocytes ie linking of bullet points)*<br><br>Eg histamines signal blood capillaries to widen → more blood flows to the area / allows more defence cells to get to the area which in turn allows more pathogens to be digested / destroyed. |

**QUESTION TWO**

| Evidence contributing to Achievement | Evidence contributing to Achievement with Merit | Evidence contributing to Achievement with Excellence |
|---|---|---|
| *Evidence to come from anywhere in the 3 questions*<br>*Describes for vaccine / active immunity ONE of ($A_a$)*:<br><br>• Vaccine made up of dead or weakened pathogens to stimulate antibody production / immune response.<br>• Vaccine helps body produce antibodies without the person having to suffer the disease (symptoms).<br>• Weakened virus in 2nd vaccine stimulates faster / quicker / more antibody production.<br><br>AND<br>*Describes for injection / passive immunity ONE of($A_p$)*:<br>• Ready-made antibodies provide immune response straight away / no time delay.<br>• Child does not have to make the antibodies themselves.<br>• Memory cells have not been made.<br>Cannot accept just 'Passive immunity is an injection of antibodies'.<br>AND *describes($A_t$):*<br>Active immunity lasts longer than passive immunity.<br>OR **vice versa.**<br>**For A overall candidate needs**<br>*$A_a$+ $A_p$ + $A_t$ from anywhere in the question* | *As for Achievement AND explains ONE of:*<br><br>*Reason for the first and second vaccines stimulating active immunity.*<br><br>Eg first vaccine containing weakened measles virus triggers / stimulates child to produce measles antibodies without suffering the disease. Over time antibody production slows down. Second vaccine causes **faster** (measles) antibody production / more of them are made.<br><br>OR<br><br>*Reason for how passive immunity is gained.*<br><br>Eg injection of ready-made antibodies gives instant short term immunity in case the child has picked up the measles pathogen. The child does not produce the measles antibodies OR antibodies from another source / animal.<br><br>Candidates need<br>*$A_a$+ $A_p$ + $A_t$ +any M for M overall* | *Discussion compares active and passive immunity from the point of how long they last and why they last that long*<br><br>Eg active immunity is when the **body produces antibodies and retains the ability / has memory cells to make more at a later.** The child has life-long active immunity. In passive immunity, the injection of ready-made antibodies gives instant short-term immunity in case the child has picked up the pathogen. The child does not produce the antibodies. In a short period of time, the **child's body destroys / breaks down the ready-made antibodies**, The child is no longer immune to the disease. |

**QUESTION THREE**

| Evidence contributing to Achievement | Evidence contributing to Achievement with Merit | Evidence contributing to Achievement with Excellence |
|---|---|---|
| *Describes any THREE of, eg:*<br><br>• **Skin** – (surface) a physical barrier to pathogens.<br>OR<br>sebum inhibits growth of (some) bacteria on skin.<br><br>• **Mucus** – sticky, traps / catches pathogens.<br><br>• **Cilia** – beating of cilia moves pathogens to back of throat to be coughed out / sneezed out / swallowed.<br><br>• **Sweat** – contains enzyme / lysozyme that breaks down / kills bacteria.<br><br>• **Acid** – on skin, may kill bacteria.<br>OR<br>stomach acid kills bacteria. | *Explains how any TWO stop entry of pathogens, eg:*<br><br>• **Skin** – a continuous layer of cells physically stops pathogens from passing through into the body. As top layer of dead skin cells is shed, it takes the bacteria with it.<br><br>• **Sticky mucus –** traps pathogens to stop them spreading. **Cilia** beat pathogens to the back of the throat to be either coughed out or swallowed. This action helps to move the mucus along.<br><br>• **Lysozymes** in **sweat** break down (some) bacteria cell walls. These bacteria can no longer spread because they can no longer function / multiply OR salts in sweat make the pathogens unable to reproduce<br><br>• **Skin acid** may attack (some) bacteria cell walls. These bacteria can no longer spread because they can no longer function / multiply.<br>OR<br>**Stomach acid** (pH1 –2) attacks most bacteria cell walls…<br>*as for above* | *Discussion shows **linkage** of explanations to prevent entry of pathogens.*<br><br>*Some possible examples:*<br><br>skin (sebum + skin acid) + sweat enzyme<br><br>OR<br><br>mucus + cilia + stomach acid effect. |

## Judgement Statement

| Achievement | Achievement with Merit | Achievement with Excellence |
|---|---|---|
| 2 **A** | 2 **M** + 1 **A**<br>*OR*<br>1 **E** + 1 **M** + 1 **A** | 2 **E** + 1 **A** |